

PATENT COOPERATION TREATY

Express Mail Mailing Label No.: EV668159635US

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| To: NASH, David, Allan Haseltine Lake Imperial House 15-19 Kingsway London WC2B 6UD GRANDE BRETAGNE | HASELTINE LAKE LONDON ACKNOWLEDGEMENT RECEIVED WITH THANKS 20 DEC 2004 | NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1) | |
| | ORIGINAL TO COPY | | RECEIVED Date of mailing (day/month/year) |
| | 21.12.2004 | | |
| | Applicant's or agent's file reference P82953PC00/JRH | | |
| International application No. PCT/GB 03/04298 | | International filing date (day/month/year) 06.10.2003 | |
| Priority date (day/month/year) 04.10.2002 | | IMPORTANT NOTIFICATION | |
| Applicant NANOMAGNETICS LIMITED et al. | | | |

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:



European Patent Office - P.B. 5818 Patentlaan 2
 NL-2280 HV Rijswijk - Pays Bas
 Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
 Fax: +31 70 340 - 3016

Authorized Officer

Bauer, J

Tel. +31 70 340-3238



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

| | | |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Applicant's or agent's file reference P82953PC00/JRH | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/GB 03/04298 | International filing date (<i>day/month/year</i>) 06.10.2003 | Priority date (<i>day/month/year</i>) 04.10.2002 |
| International Patent Classification (IPC) or both national classification and IPC H01F1/00 | | |
| Applicant NANOMAGNETICS LIMITED et al. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the opinion

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☐ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☐ Certain observations on the international application

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Date of submission of the demand 04.05.2004 | Date of completion of this report 21.12.2004 |
| Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 </div> </div> | Authorized Officer Stichauer, L Telephone No. +31 70 340-1959 |



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB 03/04298

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-131 as originally filed

Drawings, Sheets

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB 03/04298

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|---------------------------------------------------------------------------------------------------------|
| Novelty (N) | Yes: Claims | 1- 51, 54,57- 60,63-68, 78-80, 86-88, 90-91,93-97,102,105-108,110-116,123-125,127-131 |
| | No: Claims | 52- 53,55- 56,61- 62,69-77,81-85,89,92,98-101,103-104,109,117-122,126 |
| Inventive step (IS) | Yes: Claims | 1- 51, 54,57- 60,63-68, 78-80, 86-88, 90-91,93-97,102,105-108,110-116,123-125,127-131 |
| | No: Claims | 52- 53,55- 56,61- 62,69-77,81-85,89,92,98-101,103-104,109,117-122,126 |
| Industrial applicability (IA) | Yes: Claims | 1-131 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

- D1: US-A-5 427 767 (LAWACZECK RUDIGER ET AL) 27 June 1995 (1995-06-27)
- D2: WO 95/05669 A (ADVANCED MAGNETICS INC) 23 February 1995 (1995-02-23)
- D3: US-A-5 670 078 (ZIOLO RONALD F) 23 September 1997 (1997-09-23)
- D4: WOODING A ET AL: "PROTEINS AND CARBOHYDRATES AS ALTERNATIVE SURFACTANTS FOR THE PREPARATION OF STABLE MAGNETIC FLUIDS" IEEE TRANSACTIONS ON MAGNETICS, IEEE INC. NEW YORK, US, vol. 24, no. 2, 1 March 1988 (1988-03-01), pages 1650-1652, XP000174168 ISSN: 0018-9464

2. CLAIMS 1-51

2.1. INDEPENDENT CLAIM 1

The document D2 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (claims 2, 5-6 and 19; page 20, lines 1-15):

"A method for making a composition of magnetic nanoparticles which includes the step of forming said magnetic nanoparticles, each within a protein template."

The subject-matter of claim 1 differs from this known method in that *"a liquid composition of said protein templates or subunits thereof is subjected to a microporous membrane filtration step prior to formation of said magnetic nanoparticles."*

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as *how to improve the stability of the resulting magnetic nanoparticles, in particular their resistance to aggregation* (see present description, page 2, lines 2-7).

The solution to this problem proposed in claim 1 of the present application is

considered as involving an inventive step (Article 33(3) PCT) for the following reasons: although ultrafiltration is disclosed in closest prior art, it is performed to separate free encapsulant from colloidal particles, and not at all with the same aim as in the present invention.

2.2. CLAIMS 2-51

Claims 2-51 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3. CLAIMS 52-131

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 52-53, 55-56, 61-62, 69-77, 81-85, 89, 92, 98-101, 103-104, 109, 117-122 and 126 is not new in the sense of Article 33(2) PCT.

- 3.1. Documents **D1** (claim 1; column 7, lines 12-51; Example 9), **D2** (claims 2, 5-6 and 19; page 20, lines 1-15) and **D3** (claim 1; column 7, lines 18-21; column 9, line 24 - column 10, line 46; example 13) each describe a method of making a composition of magnetic nanoparticles according to the subject-matter of independent claim 52.

Hence, independent claim 52 lacks novelty as required by Art.33(2) PCT.

- 3.2. Documents D1 (section 2.1. of present communication; column 15, lines 35-40) and D4 (the whole document) each describe a stable composition of magnetic nanoparticles according to the subject-matter of independent claim 98.

Hence, independent claim 98 lacks novelty as required by Art.33(2) PCT.

- 3.3. The subject-matter of dependent claims 53, 55-56, 61-62, 69-77, 81-85, 89, 92, 99-101, 103-104, 109, 117-122 and 126 is known from prior art (see D1-D3 each for claims 53, 55-56, 61, 69-72, 75, 82-84 and 92; see D3 for claims 62, 73-74 and 76-77; see D1 and D2 each for claim 81; see D2 and D3 each for claim 85; see D2 for claim 89; see D1 and D4 each for claims 99-101, 103-104, 109 and 117-121; see D4 for claim 122; see D1 for claim 126).

Hence, dependent claims 53, 55-56, 61-62, 69-77, 81-85, 89, 92, 99-101, 103-104, 109, 117-122 and 126 lack novelty as required by Art.33(2) PCT.

- 3.4. CLAIMS 54, 57-60, 63-68, 78-80, 86-88, 90-91, 93-97, 102, 105-108, 110-116, 123-125 and 127-131

The combinations of the features of dependent claims 54, 57-60, 63-68, 78-80, 86-88, 90-91, 93-97, 102, 105-108, 110-116, 123-125 and 127-131 are neither known from, nor rendered obvious by, the available prior art.

4. The present invention relates to a process for the preparation of a stable composition of magnetic nanoparticles. The compositions of the present invention are useful in particular in the production of magnetic recording media.